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TITLE: Method for representing and  
comparing multimedia content

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INVENTOR-INFORMATION:

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US-CL-CURRENT: 382/190, 382/232 , 707/104.1

ABSTRACT:

A method for generating a representation of multimedia content by first segmenting the multimedia content spatially and temporally to extract objects. Feature extraction is applied to the objects to produce semantic and syntactic attributes, relations, and a containment set of content entities. The content entities are coded to produce directed acyclic graphs of the content entities, where each directed acyclic graph represents a particular interpretation of the multimedia content.

18 Claims, 10 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

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Brief Summary Text - BSTX (7):

The most recent standardization effort taken on by the MPEG committee is that of **MPEG-7**, formally called "Multimedia Content **Description** Interface," see "**MPEG-7** Context, Objectives and Technical Roadmap," ISO/IEC N2729, March 1999. Essentially, this standard plans to incorporate a set of **descriptors and description** schemes that can be used to describe various types of multimedia content. The **descriptor and description** schemes are associated with the content itself and allow for fast and efficient searching of material that is of interest to a particular user. It is important to note that this standard is not meant to replace previous coding standards, rather, it builds on other standard representations, especially MPEG-4, because the multimedia content can be decomposed into different objects and each object can be assigned a unique set of **descriptors**. Also, the standard is independent of the format in which the content is stored. **MPEG-7 descriptors** can be attached to compressed or uncompressed data.

Brief Summary Text - BSTX (8):

**Descriptors** for multimedia content can be used in a number of ways, see for example "**MPEG-7** Applications," ISO/IEC N2728, March 1999. Most interesting, for the purpose of the **description** below, are database search and retrieval applications. In a simple application environment, a user may specify some attributes of a particular object. At this low-level of representation, these attributes may include **descriptors** that describe the texture, motion and shape of the particular object. A method of representing and comparing shapes has been described in U.S. patent application Ser. No. 09/326,759 "Method for Ordering Image Spaces to Represent Object Shapes" filed on Jun. 4, 1999 by Lin et al. One of the drawbacks of this type of **descriptor** is that it is not straightforward to effectively combine this feature of the object with other low-level features. Another problem with such low-level **descriptors**, in general, is that a high-level interpretation of the object or multimedia content is difficult to obtain. Hence, there is a limitation in the level of representation.

Brief Summary Text - BSTX (9):

To overcome the drawbacks mentioned above and obtain a higher-level of representation, one may consider more elaborate **description** schemes that combine several low-level **descriptors**. In fact, these **description** schemes may

even contain other description schemes, see "MPEG-7  
Description Schemes  
(V0.5)," ISO/IEC N2844, July 1999.